



**TG 6** A computer simulation is designed to draw random samples of size  $n$  from a large dataset. The proportion of the population that exhibits a certain characteristic is  $p = 0.25$ .

If  $\hat{p}$  represents the sample proportion exhibiting the characteristic under investigation, find the largest\* sample size that should be used so that the standard deviation of  $\hat{p}$  is at least 0.01. \* NESA has 'smallest' ... projectmaths

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$$n = ? \text{ and } p = 0.25$$

$$\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}} \geq 0.01$$

$$\sqrt{\frac{0.25(1-0.25)}{n}} \geq 0.01$$

$$\frac{0.1875}{n} \geq 0.0001$$

$$0.0001n \leq 0.1875$$

$$n \leq 1875$$

$\therefore$  the sample size is 1875.

\* These solutions have been provided by [projectmaths](http://projectmaths.com.au) and are not supplied or endorsed by NESA.

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